**WE CLAIM:**

1. A method of generating a mask design having optical proximity correction features disposed therein, said method comprising the steps of:

obtaining a desired target pattern having features to be imaged on a substrate;

determining an interference map based on said target pattern, said interference map defining areas of constructive interference and areas of destructive interference between at least one of said features to be imaged and a field area adjacent said at least one feature; and

placing assist features in the mask design based on the areas of constructive interference and the areas of destructive interference.

2. The method of claim 1, wherein the step of determining the interference map comprising the steps of:

reducing the size of the features contained in the desired target pattern such that the size of the features are less than the resolution capability of an image system to be utilized to image the mask, thereby generating a reduced size target pattern; and

performing an optical simulation of the reduced size target pattern, said simulation being performed such that the field area of the reduced size target pattern has percentage transmission which is greater than zero.

3. The method of claim 2, wherein the critical dimensions of the features contained in the reduced size target pattern are less than $\lambda/(2\pi \cdot NA)$, where $\lambda$ is the exposure wavelength of the imaging tool and NA stands for the numerical aperture of a projection lens of the image system

4. The method of claim 1, wherein said interference map also defines neutral areas of interference, said neutral areas not resulting in either constructive interference or destructive interference relative to the feature to be imaged.

5. The method of claim 1, wherein said assist features to be disposed in said mask design comprises scatter bars, anti-scatter bars and non-printing assist features.

6. The method of claim 5, wherein assist features which enhance the printing of said feature to be imaged are disposed in constructive areas of interferences, and assist features which negate destructive interference are disposed in destructive areas of interference.

7. The method of claim 1, wherein the interference map defines intensity levels of the field relative to the featured to be images, said interference map being capable of representing both positive and negative values of intensity relative to a non-zero DC level,

wherein regions of the field having intensity values which are positive relative to said non-zero DC level correspond to constructive areas of interference, and regions of the field having intensity values which are negative relative to said non-zero DC level correspond to destructive areas of interference areas.

8. An apparatus for generating a mask design having optical proximity correction features disposed therein, said apparatus comprising the steps of:

means for obtaining a desired target pattern having features to be imaged on a substrate;

means for determining an interference map based on said target pattern, said interference map defining areas of constructive interference and areas of destructive interference between at least one of said features to be imaged and a field area adjacent said at least one feature; and

means for placing assist features in the mask design based on the areas of constructive interference and the areas of destructive interference.

9. The apparatus of claim 8, wherein determining the interference map includes:

reducing the size of the features contained in the desired target pattern such that the size of the features are less than the resolution capability of an image system to be utilized to image the mask, thereby generating a reduced size target pattern; and

performing an optical simulation of the reduced size target pattern, said simulation being performed such that the field area of the reduced size target pattern has percentage transmission which is greater than zero.

10. The apparatus of claim 9, wherein the critical dimensions of the features contained in the reduced size target pattern are less than $\lambda/(2\pi \cdot NA)$, where $\lambda$ is the exposure wavelength of the imaging tool and NA stands for the numerical aperture of a projection lens of the image system

11. The apparatus of claim 8, wherein said interference map also defines neutral areas of interference, said neutral areas not resulting in either constructive interference or destructive interference relative to the feature to be imaged.

12. The apparatus of claim 8, wherein said assist features to be disposed in said mask design comprises scatter bars, anti-scatter bars and non-printing assist features.

13. The apparatus of claim 12, wherein assist features which enhance the printing of said feature to be imaged are disposed in constructive areas of interferences, and assist features which negate destructive interference are disposed in destructive areas of interference.

14. The apparatus of claim 8, wherein the interference map defines intensity levels of the field relative to the featured to be images, said interference map being capable of representing both positive and negative values of intensity relative to a non-zero DC level,

wherein regions of the field having intensity values which are positive relative to said non-zero DC level correspond to constructive areas of interference, and regions of the field having intensity values which are negative relative to said non-zero DC level correspond to destructive areas of interference areas.

15. A computer program product for controlling a computer comprising a recording medium readable by the computer, means recorded on the recording medium for directing the computer to generate files corresponding to a mask for use in an lithographic imaging process, said generation of said files comprising the steps of:

obtaining a desired target pattern having features to be imaged on a substrate;

determining an interference map based on said target pattern, said interference map defining areas of constructive interference and areas of destructive interference between at least one of said features to be imaged and a field area adjacent said at least one feature; and

placing assist features in the mask design based on the areas of constructive interference and the areas of destructive interference.

16. The computer program product of claim 15, wherein the step of determining the interference map comprising the steps of:

reducing the size of the features contained in the desired target pattern such that the size of the features are less than the resolution capability of an image system to be utilized to image the mask, thereby generating a reduced size target pattern; and

performing an optical simulation of the reduced size target pattern, said simulation being performed such that the field area of the reduced size target pattern has percentage transmission which is greater than zero.

17. The computer product of claim 16, wherein the critical dimensions of the features contained in the reduced size target pattern are less than $\lambda/(2\pi \cdot NA)$, where $\lambda$ is the exposure wavelength of the imaging tool and NA stands for the numerical aperture of a projection lens of the image system

18. The computer product of claim 15, wherein said interference map also defines neutral areas of interference, said neutral areas not resulting in either constructive interference or destructive interference relative to the feature to be imaged.

19. The computer product of claim 15, wherein said assist features to be disposed in said mask design comprises scatter bars, anti-scatter bars and non-printing assist features.

20. The computer product of claim 19, wherein assist features which enhance the printing of said feature to be imaged are disposed in constructive areas of interferences, and assist features which negate destructive interference are disposed in destructive areas of interference.

21. The computer product of claim 15, wherein the interference map defines intensity levels of the field relative to the featured to be images, said interference map being capable of representing both positive and negative values of intensity relative to a non-zero DC level,

wherein regions of the field having intensity values which are positive relative to said non-zero DC level correspond to constructive areas of interference, and regions of the field having intensity values which are negative relative to said non-zero DC level correspond to destructive areas of interference areas.